**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 73.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Pursell, Gary
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-007435
**Date Inspected:** 18-Jun-2009

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** HoChang, Korea

**OSM Arrival Time:** 800
**OSM Departure Time:** 1800
**Location:** Unyang/Changwon, Kore

**CWI Name:** Sang Ho Kwak

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|---|---|---|---|---|---|---|---|---|
| **Inspected CWI report:** | ☐ Yes | ☐ No | ☑ N/A | **CWI Present:** | ☑ Yes | ☐ No | |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Rod Oven in Use:** | ☐ Yes | ☐ No | ☑ N/A |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A |

**Bridge No:** 34-0006
**Component:** Pier E2 bearing and Shear key

**Summary of Items Observed:**

The following report is based on METS observations at HoChang Machinery Industries (HCMI). Current work: Casting, forging and machining.

On this date the Caltrans Quality Assurance (QA) inspector, Dong J. Shin arrived at HoChang Machinery Industries (HCMI) located at Unyang, Korea and DooSan Heavy Industries(DHIC) located at Changwon, Korea. The Purpose of this trip was to observe quality control during fabrication and process of following items.

Forging

1. Bearing Bottom Housing (B1-07/F07302-010): Completed final UT
2. Bearing Bottom Housing (B2-07/F07302-020): Completed final UT
3. Bearing Bottom Housing (B3-07/F07302-030): Completed final UT
4. Bearing Bottom Housing (B4-07/F07302-040): Completed MT
5. Spherical Ring (S1-07/F07302-050): Completed final UT
6. Spherical Ring (S2-07/F07302-060): Completed final UT
7. Spherical Ring (S3-07/F07302-070): Completed final UT
8. Spherical Ring (S4-07/F07302-080): Completed final UT
9. Solid Shaft (B1-02/F07302-090): Completed final UT
10. Solid Shaft (B2-02/F07302-100): Completed final UT
11. Solid Shaft (B3-02/F07302-110): Completed MT
12. Solid Shaft (B4-02/F07302-120): Completed MT

• F number is DooSan Production Number.
• B number is drawing Number .

Casting

On this date the QA inspector observed DHIC performing repair welding on the castings listed below. The QA inspector observed HMIC QC inspector and DHIC QC inspector verify the welding parameters of the welding personnel listed below prior to the start of repair welding. The QA inspector observed the welding process utilized Flux Core Arc Welding (FCAW) with filler metal E81T1-K2, 1.6mm diameter and manufacture by SEAH-ESAB with brand name Dual shield 1181-K2. The QA inspector observed the following welding parameters; 23-26 volts and 210-250 amps with a travel speed of 13-16 cm/min. The QA inspector observed a shielding gas flow of 10-25 l/min and a preheat temperature of over 100ºC, which appeared to be maintained 24 hours a day.

The welding parameters observed appeared to comply with the approve welding procedure specification; A-F-Z1Z1-219.

Welder: Mr. YT, Kim welding on S4-01.
Mr. DJ, Kang and Mr. JH, Kim welding on S3-03.
Mr. JH, Nam welding on B2-06.
Mr. HD, Lee welding on B4-01-2(Minor repair welding using GTAW)

The QA inspector observed DHIC NDT technician have performed the final MT and UT on S3-01(Stub), B3-06(Bearing top housing) and B2-01-2(Bearing Hold Down) as noted below. The QA inspector verified the following items prior to NDT testing :
MT: yoke lifting power, pie gauge magnetic field strength, and calibration date.
UT: Calibration date, Distance Amplitude Correction (DAC) calibration, transducer size and frequency.

The QA inspector observed the following UT equipment was in use;
Transducer: Straight Beam, 24mm diameter, 2Mhz,
Angle Beam: 20 x 22mm 1Mhz at 45º
Dual Straight Beam: 6 x 20mm, 4Mhz

1. Bearing Top Housing(B1-06, C07039-010): Continued repair welding.
2. Bearing Top Housing(B2-06, C07039-020): Started repair welding.
3. Bearing Top Housing(B3-06, C07039-030): Started final UT
4. Bearing Top Housing(B4-06, C07039-040): Completed PWHT
5. Bearing Hold Down Assembly (B1-01-1, C07039-050): Completed Final UT
6. Bearing Hold Down Assembly (B1-01-2, C07039-060): Completed Final UT
7. Bearing Hold Down Assembly (B2-01-1, C07039-070): Completed Final UT
8. Bearing Hold Down Assembly (B2-01-2, C07039-080): Started final UT
9. Bearing Hold Down Assembly (B3-01-1, C07039-170): Completed Final UT

10. Bearing Hold Down Assembly (B3-01-2, C07039-180): Completed Final UT
11. Bearing Hold Down Assembly (B4-01-1, C07039-190): Completed Final UT
12. Bearing Hold Down Assembly (B4-01-2, C07039-200): Completed PWHT
13. Shear Key Stub(S1-01, C07039-090) : Completed PWHT
14. Shear Key Stub(S2-01, C07039-100) : Completed PWHT
15. Shear Key Stub(S3-01, C07039-110) : Started final UT
16. Shear Key Stub(S4-01, C07039-120) : Continued repair welding.
17. Shear key Housing(S1-03, C07039-130): Continued repair welding.
18. Shear key Housing(S2-03, C07039-140): Completed PWHT
19. Shear key Housing(S3-03, C07039-150): Started repair welding
20. Shear key Housing(S4-03, C07039-160): Started repair welding

* S and B number is drawing number.
* C number is DSHI ID number





**Summary of Conversations:**

*Discuss with Mr. S. H. Kwak regarding general project schedule.

**Comments**

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy, (510) 385-5910, who represents the Office of Structural Materials for

your project.

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| **Inspected By:** | Shin,DJ | Quality Assurance Inspector |
| **Reviewed By:** | Hager,Craig | QA Reviewer |